

**CHLORINATED PARAFFINS (C<sub>12</sub>, 60% CHLORINE)**  
**CAS No. 108171-26-2**

First Listed in the *Fifth Annual Report on Carcinogens*

## **CARCINOGENICITY**

Chlorinated paraffins (C<sub>12</sub>, 60% chlorine) are *reasonably anticipated to be human carcinogens* based on sufficient evidence of carcinogenicity in experimental animals. When administered by gavage, chlorinated paraffins are carcinogenic in rats and mice of both sexes. Chlorinated paraffins caused increased incidences of hepatocellular neoplasms in male and female rats, adenomas of the kidney tubular cells in male rats, and follicular cell adenomas of the thyroid gland in female rats. Mononuclear cell leukemia in male rats may have been related to administration of chlorinated paraffins. In male and female mice, chlorinated paraffins caused increased incidences of hepatocellular neoplasms. Female mice administered chlorinated paraffins also showed increased incidences of adenomas of thyroid gland follicular cells (NTP 308, 1986).

There are no data available to evaluate the carcinogenicity of chlorinated paraffins in humans.

## **PROPERTIES**

Chlorinated paraffins are light yellow-to-amber, viscous, oily liquids that are usually odorless. The compounds are mixtures of paraffins of different carbon-chain length and varying chlorine content. They are insoluble in water and glycerine but are miscible with benzene, chloroform, ether, and carbon tetrachloride. Chlorinated paraffins are slightly soluble in alcohol and are soluble in most aromatic, aliphatic, and terpene hydrocarbons, ketones, esters, and vegetable and animal oils. Chlorinated paraffins have low volatility. When heated to decomposition, they emit toxic fumes of hydrochloric acid and other chlorinated compounds.

## **USE**

Chlorinated paraffins are used primarily as extreme pressure lubricant additives (50% of the chlorinated paraffins produced). They are also used as flame retardants for plastics including vinyl flooring, carpet backing, and wire and cable coatings (20%). Chlorinated paraffins are also used as plasticizers in rubber (12%), paints (9%), adhesives (4%), and caulks and sealants (2%). The remaining 4% of production is exported or used as a plasticizer in inks, paper and textile coatings, and flexible poly(vinyl chloride) (SRI, 1983, 1985).

## **PRODUCTION**

The class of chlorinated paraffins with C<sub>12</sub> length and 60% by weight chlorination is represented by a specific compound known as Chlorowax 500C, which is a tradename for a product marketed by a single domestic manufacturer. The 1997 *Directory of Chemical Producers* identifies four producers of chlorinated paraffins, producing a total of 211 million lb (SRIa, 1997). There are no available production, import, or export data for chlorinated paraffins (C<sub>12</sub>, 60% chlorine).

The production capacity of chlorinated paraffins declined from 263 million lb in 1980 to 218 million lb in 1983. This decline has been blamed on economic conditions in the petrochemical industry and in the end-use industries where demand has grown by < 1% over the past decade; future growth of this market is expected to be sluggish (Long, 1984).

Export data have been reported for C<sub>10</sub>-C<sub>30</sub> length chlorinated paraffins. In 1984, 14.4 million lb were exported, a decrease from the 21.6 million lb reported for 1983 (USDOC Exports, 1985, 1984). In 1982, the figure was 16.2 million lb, with 3.6 million lb of paraffins with 35-64% chlorine content (USDOC Exports, 1983; Long, 1984).

## **EXPOSURE**

No information on potential human exposure specifically to chlorinated paraffins (C<sub>12</sub>, 60% chlorine) was found, but information on potential human exposure to the class of chlorinated paraffins is available. The primary route of potential human exposure is by ingestion, both directly and through manual contamination of foodstuffs (Campbell and McConnell, 1980). Chlorinated paraffins have been isolated from human liver (up to 1.5 ppm) and adipose tissue. Various chlorinated paraffins exhibit little or no potential to irritate the skin of humans, and no incidents of human intoxication have been reported in workers involved in the handling or manufacturing of chlorinated paraffins (NTP 308, 1986). The National Occupational Exposure Survey (1981-1983) indicated that 573,193 workers, including 38,354 women, potentially were exposed to chlorinated paraffins (CASRN 63449-39-8, degree of chlorine substitution unspecified) (NIOSH, 1984). The ACGIH has not recommended any workplace exposure limits for chlorinated paraffins (ACGIH, 1996).

## **REGULATIONS**

EPA regulates chlorinated paraffins under the Toxic Substances Control Act (TSCA), requiring the reporting of general health effects of the compounds, and the Resource Conservation and Recovery Act (RCRA; criteria for municipal solid waste landfills). TSCA's Interagency Testing Committee (ITC) has designated chlorinated paraffins as priority chemicals and has recommended testing. EPA also regulates chlorinated paraffins under the Clean Air Act (CAA; section 112): Standards that regulate specific categories of stationary sources that emit (or have potential to emit) one or more hazardous air pollutants. FDA regulates chlorinated paraffins as indirect food additives, adhesives, and components of other products which may come into contact with foods. OSHA regulates chlorinated paraffins under the Hazard Communication Standard and as chemical hazards in laboratories. Regulations are summarized in Volume II, Table B-20.